Name: Date:

Polynomial Factoring solution (version 33)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 12x + 48 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(48)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 192}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-48}}{2}$$

$$x = \frac{12 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{12 \pm 4\sqrt{3}\,i}{2}$$

$$x = 6 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 + 5i$ and $-2 - 6i$ in standard form $(a + bi)$.**

Solution

$$(-9 + 5i) \cdot (-2 - 6i)$$

$$18 + 54i - 10i - 30i^2$$

$$18 + 54i - 10i + 30$$

$$18 + 30 + 54i - 10i$$

$$48 + 44i$$

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3. **Write function $f(x) = x^3 + 2x^2 - 19x - 20$ in factored form. I'll give you a hint: one factor is $(x - 4)$.**

Solution

	1	2	-19	-20
4		4	24	20
	1	6	5	0

$$f(x) = (x-4)(x^2+6x+5)$$

$$f(x) = (x-4)(x+1)(x+5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+4) \cdot (x+1)^2 \cdot (x-4)$$

Sketch a graph of polynomial $y = p(x)$.